

1 REMARKS

2 Status of the Claims

3 Claims 1, 4, 5, 21, 24, 29-38, and 44-53 remain pending in the present application, with
4 Claims 1, 48, 51, and 52 having been amended above to more clearly distinguish over the art cited.
5 Claims 4, 5, 21, 24, 29-32, 34-38, 46, 47, 49, 50, and 53 are currently allowed.

6 Rejection of Claims 1, 33, 45, 51, and 52 under 35 U.S.C. § 103(a)

7 The Examiner has rejected Claims 1, 33, 45, 51, and 52 under 35 U.S.C. § 103(a) as
8 unpatentable over U.S. Patent No. 5,859,375 (Danylewych-May et al – hereinafter referred to as
9 “Danylewych-May”), in view of U.S. Publication No. 2002/0124664 (Call et al. – hereinafter referred
10 to as “Call”).

11 In regard to Claim 1, the Examiner asserts that Danylewych-May teaches an air sensor device
12 that is configured to collect particulates for evaluation to determine if they indicate the presence of a
13 biological threat. However, the Examiner acknowledges that Danylewych-May does not specifically
14 teach a fluorescence detector, but relies on Call as disclosing a sampling system for screening
15 incoming mail and teaching a particle counter comprising an ultraviolet laser and a photomultiplier
16 tube (PMT) for collection of particle fluorescence, such as laser-induced autofluorescence of
17 nicotinamide adenine dinucleotide hydrogen (NADH) and nicotinamide adenine dinucleotide
18 phosphate hydrogen (NADPH). The Examiner concludes that it would be obvious to substitute the
19 detector of Danylewych-May for Call’s PMT, to enable detection of autofluorescence.

20 In regard to Claim 33, the Examiner asserts that Danylewych-May further discloses that the
21 device “comprises a liquid coating applicator configured to moisten the regenerable solid collection
22 surface” (with reference to col. 6, lines 1-7 of the Danylewych-May). Applicants respectfully
23 disagree with this assertion for reasons discussed below.

24 In regard to Claim 51, the Examiner indicates that Danylewych-May “teaches a method
25 comprising: depositing airborne particles on a regenerable collection surface, measuring a biological
26 signature present in the particles comprising the spot, determining a concentration of the immobilized
27 airborne particles, and regenerating the regenerable collection surface by removing particles from the
28 regenerable collection surface” (with reference to col. 5, line 35 through col. 6, line 55). She
29 acknowledges that Danylewych-May does not specifically teach a biological signature comprising
30 autofluorescence, but again cites Call as teaching detection of autofluorescence and concludes that it

1 would have been obvious to modify the detection parameters of Danylewych-May by identifying
2 samples that autofluoresce.

3 In regard to Claim 52, the Examiner relies on Danylewych-May as discussed above, but
4 acknowledges that this reference does not teach a processor configured to activate at least one
5 additional component if the means for analyzing the spot of immobilized airborne particles indicates
6 that the particles are potentially harmful to biological organisms. She relies upon Call teaching a
7 triggering sampler that “sends a signal to a control unit once the quantity of particulates of a sample
8 has exceeded its threshold value.” The Examiner further notes that the control unit then sends a
9 signal to activate a detecting sampler, which determines if a chemical or biological agent is present in
10 the sample and concludes that it would have been obvious to modify the device of Danylewych-May
11 to incorporate Call’s control unit.

12 In regard to Claim 45, the Examiner acknowledges that Danylewych-May does not
13 specifically disclose an aerosol sampler or additional aerosol analyzer, but indicates that the particle
14 counter of Call corresponds to an aerosol sampler or additional aerosol analyzer. The Examiner
15 concludes that it would be obvious to modify Danylewych-May to incorporate Call’s particle counter
16 for this purpose.

17 Rejection of Claims 44 and 48 under 35 U.S.C. § 103(a)

18 Claims 44 and 48 are rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent
19 No. 3,572,128 (Hemeon) in view of Call. The Examiner asserts that Hemeon discloses an air sensor
20 device (citing Figs 1-4) that includes a regenerable solid collection surface that removes particles
21 from an air stream by impaction of the air stream against a regenerable solid collection surface (citing
22 Fig. 3 and col. 3, lines 13-58), means for regenerating the regenerable solid collection surface without
23 removing it from the air sensor device, such that particles collected are no longer present to
24 contaminate new particles that are collected after regeneration (citing Fig. 3, and col. 3, lines 13-58),
25 and means for analyzing the spot of immobilized airborne particles while the particles remain
26 disposed on the regenerable solid collection surface without removing the regenerable solid
27 collection surface from the air sensor device (citing col. 2, line 59 – col. 3, line 2). The Examiner
28 acknowledges that Hemeon does not disclose removing particles from the filter paper to which the
29 particles are transferred from the wiper that scrapes the particles from the collection surface, but
30 asserts that “it would have been obvious to a person of ordinary skill in the art to modify Hemeon’s

1 invention by incorporating additional wipers to remove particles from the surface of the filter paper
2 because it would be more time- and cost-efficient to continuously clean and re-use the same filter
3 paper.” The Examiner further concludes that it would be obvious to modify Hemeon’s invention by
4 incorporating a particle counter such as that disclosed by Call, which is configured to determine an
5 amount of airborne particles. Applicants respectfully disagree with this rejection for the reasons
6 discussed below.

7 In the interest of reducing the complexity of the issues for the Examiner to consider in this
8 response, the following discussion focuses on independent Claims 1, 48, 51, and 52. The
9 patentability of each remaining dependent claim is not necessarily separately addressed in detail.
10 However, applicants’ decision not to discuss the differences between the cited art and each dependent
11 claim should not be considered as an admission that applicants concur with the Examiner’s
12 conclusion that these dependent claims are not patentable over the disclosure in the cited references.
13 Similarly, applicants’ decision not to discuss differences between the prior art and every claim
14 element, or every comment made by the Examiner, should not be considered as an admission that
15 applicants concur with the Examiner’s interpretation and assertions regarding those claims. Indeed,
16 applicants believe that all of the dependent claims patentably distinguish over the references cited. In
17 any event, a specific traverse of the rejection of each dependent claim is not required, since
18 dependent claims are patentable for at least the same reasons as the independent claims from which
19 the dependent claims ultimately depend.

20 Patentability of Independent Claims 1 and 52

21 While not agreeing that the combination proposed by the Examiner would be obvious,
22 applicants have amended Claims 1 and 52 to recite “a regenerable solid collection surface comprising
23 *an impaction plate* for supporting a spot of immobilized airborne particles” (emphasis added). In
24 explaining her reasons for allowing Claims 4, 5, 21, 24, 29-32, 34-38, 46, 47, 49-50, and 53, the
25 Examiner noted that none of the prior art teaches or fairly suggests a device or a method in which a
26 “regenerable solid collection surface is part of an impaction plate.” Accordingly, the amendment to
27 Claims 1 and 52 makes this distinction over the cited art clear, so that Claims 1 and 52 are allowable
28 over the cited art for at least the reason noted by the Examiner.

1 Patentability of Independent Claim 48

2 Claim 48 has been amended to now recite “a particle counter configured to determine *at least*
3 *one of a particle size distribution, and particle shape distribution* of airborne particles” (emphasis
4 added). This amendment is supported by the discussion of how particle counters can be used in
5 applicants’ specification. Nothing in the cited art discusses the use of a particle counter to determine
6 either particle size distribution or particle shape distribution. Instead, Call simply discusses the use of
7 particle counters for determining the particle count or concentration of particles.

8 In addition, applicants disagree with the Examiner’s assertion that it would be obvious to a
9 person of ordinary skill in this art to modify Hemeon by adding additional wipers to regenerate the
10 filter paper so that it can be reused to collect new particles. In col. 1, lines 41-52, Hemeon discloses a
11 collection surface comprising a “horizontal disc or table 7 having a highly polished upper surface.”
12 Hemeon further teaches that “[T]he table may be made of glass, stainless steel or any other suitable
13 material.” In col. 1, lines 68-69, Hemeon teaches that “the wipers may be made of leather, cloth or
14 felt.” While the wipers disclosed by Hemeon might be used to remove collected dust particles from a
15 collection surface comprising a polished surface made of glass or metal, it is clear that such wipers
16 are not capable of removing all dust particles deposited in a spot from the filter paper to regenerate it
17 for reuse in collecting another sample from the wipers. Clearly, given the porous nature of filter
18 paper, residual dust particles not removed by a wiper would remain on the filter paper and thereby
19 interfere with the measurement of new dust particles transferred from the wiper.

20 Applicants agree that Hemeon discloses wipers for regenerating the collection surface
21 comprising a glass or metal plate, but this reference does not teach or suggest that wipers are capable
22 or even useful for regenerating filter paper so it can be reused. The Examiner is respectfully
23 reminded that Claim 48 specifically recites that “the regenerable collection solid surface can collect
24 additional particles from the air, *such that particles collected before regenerating the regenerable*
25 *solid collection surface are substantially no longer present to contaminate particles collected after*
26 *regeneration.*” This requirement cannot be met by the Examiner’s proposal to use wipers to
27 regenerate the filter paper, since there is no teaching that wipers would be able to clear all of the
28 previously collected dust particles from the filter paper.

29 In addition, Claim 48 recites “means for analyzing the spot of immobilized airborne particles
30 while the particles remain disposed on the regenerable solid collection surface *without removing the*

1 *regenerable solid collection surface from the air sensor device*” (emphasis added). In contrast, at
2 col. 2, lines 59–67, Hemeon teaches the following.

3 The samples of dust on the filter paper are far too small to be weighed. Nevertheless,
4 when properly concentrated in suitably small circular areas they are visible as dark
5 stains and can easily be measured by optical means. They can be measured by a light
6 reflecting system or by a light transmission system. Apparatus for the latter is shown
7 in FIG. 4, where it will be seen that the *filter paper 24 has been placed over a small
8 opening 26 in the top of a box 27* containing an electric lamp 28. (Emphasis added.)

9 It appears from the preceding description and from the illustration shown in FIG. 4 of
10 Hemeon that the filter paper *must be removed* from the sampling apparatus that vacuums the
11 collected dust particles from the wiper and *placed over opening 26 in box 27*. Thus, even if the filter
12 paper were viewed as equivalent to applicants’ regenerable solid collection surface, the filter paper
13 does not remain in the sampling apparatus when being used to measure the concentration of the
14 collected dust particles (which the Examiner implies is equivalent to applicants’ recitation of
15 “analyzing the spot of immobilized airborne particles”). The cited art thus fails to meet the recitation
16 of Claim 48. Accordingly, Claim 48 is patentable over the art cited.

16 Patentability of Independent Claim 51

17 Applicants have amended Claim 51 to recite (in part):

18 providing a sensor configured for depositing airborne particles on a
19 regenerable solid collection surface provided for supporting a spot of immobilized
20 airborne particles, such that the particles deposited on the regenerable solid collection
21 surface form a spot;

22 *without removing the regenerable solid collection surface from the sensor,*
23 measuring a biological signature present in the particles comprising the spot, using a
24 detector configured for sensing the biological signature of the particles, while the
25 particles remain deposited on the regenerable solid collection surface *disposed within
26 the sensor*, the biological signature comprising an autofluorescence. (Emphasis
27 added.)

28 As noted above in applicants’ discussion of the patentability of Claim 48, Hemeon does NOT
29 teach that the concentration of dust particles on the filter paper is measured *while the filter paper
30 remains in the sampling apparatus*. The amendment to Claim 51 requires that a biological signature
present in the particles comprising a spot collected on the regenerable solid collection surface be
measured *without removing the regenerable solid collection surface from the sensor* that is
configured to deposit airborne particles on the regenerable solid collection surface. Claim 51 further

1 provides that the biological signature comprises autofluorescence, which is detected *while the*
2 *particles remain deposited on the regenerable solid collection surface disposed within the sensor.*
3 Since Hemeon teaches that the concentration of dust particles comprising a spot on the filter paper be
4 measured optically by placing (impliedly, by removing and relocating) the filter paper over an
5 opening in a box 27 containing an electric lamp 28, it will be apparent that the cited art does not teach
6 detecting autofluorescence of particles collected on a regenerable solid collection surface that
7 remains in the sensor where the particles were collected. Accordingly, Claim 51 is patentable over
8 the art of record.

9 Patentability of Dependent Claims 33, 44, and 45

10 Since dependent claims inherently include all of the recitation of the independent claim on
11 which they ultimately depend, for at least the same reasons as noted above in connection with
12 independent Claims 1 and 48, the rejection of dependent Claims 33, 44, and 45 should also be
13 withdrawn.

14 In addition, as noted above, the Examiner rejected Claim 33 based on the assertion that
15 Danylewych-May teaches a device that “comprises a liquid coating applicator configured to moisten
16 the regenerable solid collection surface” and referred to col. 6, lines 1-7 of the Danylewych-May.
17 However, this portion of Danylewych-May specifically states:

18 The substrate 45 could be provided with a coating indicated at 48, to enhance its
19 ability to collect and entrap at least one of desired particles, droplets and chemical
20 agents. The substrate coating can include a chemical treatment to modify the
21 chemistry of the substrate during desorption and pyrolysis cycles. Further the coating
22 48 can include means for trapping particles electrostatically.

23 Clearly, the referenced portion of Danylewych-May does not teach or suggest the use of a
24 liquid coating applicator for use in moistening a collection surface. The coating taught by
25 Danylewych-May need not be liquid at all, since Danylewych-May teaches that the coating can
26 include a chemical treatment. More importantly, the use of a coating in this reference does not
27 suggest that a liquid coating applicator be used with the device of Danylewych-May. Accordingly,
28 there is no justification for the Examiner’s rejection of Claim 33 over this reference.

29 In consideration of the amendment to the claims and the Remarks set forth above, it is
30 applicants’ position that all claims in the current application are patentable over the art of record.
The Examiner is thus requested to pass this case to issue without further delay. In the event that any

1 other issues remain, the Examiner is invited to telephone applicants' attorney at the number listed
2 below.

3 Respectfully submitted,

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